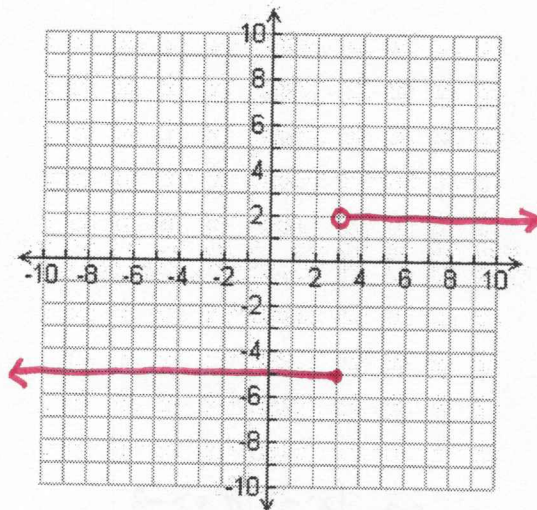


Name:

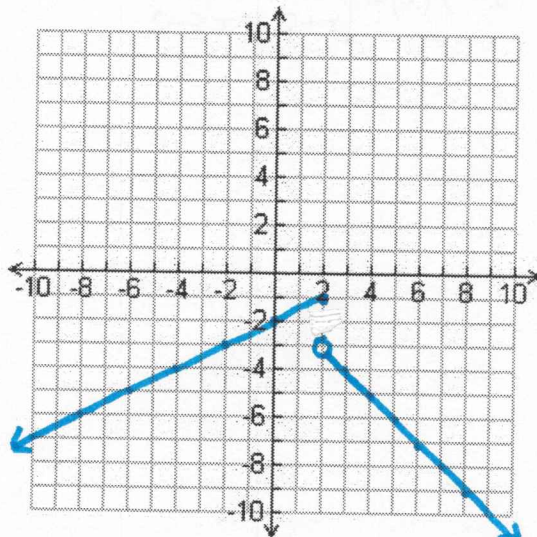
*Solutions / Answers*

Neatly and carefully graph each piecewise function:

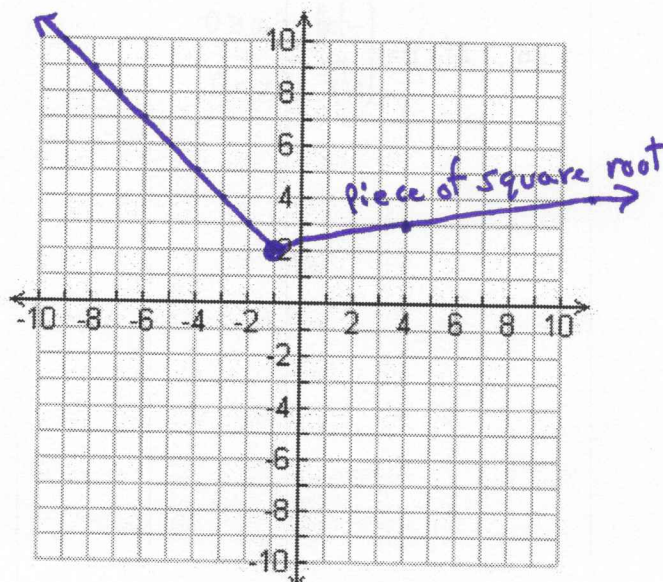
1.  $f(x) = \begin{cases} -5 & \text{if } x \leq 3 \\ 2 & \text{if } x > 3 \end{cases}$



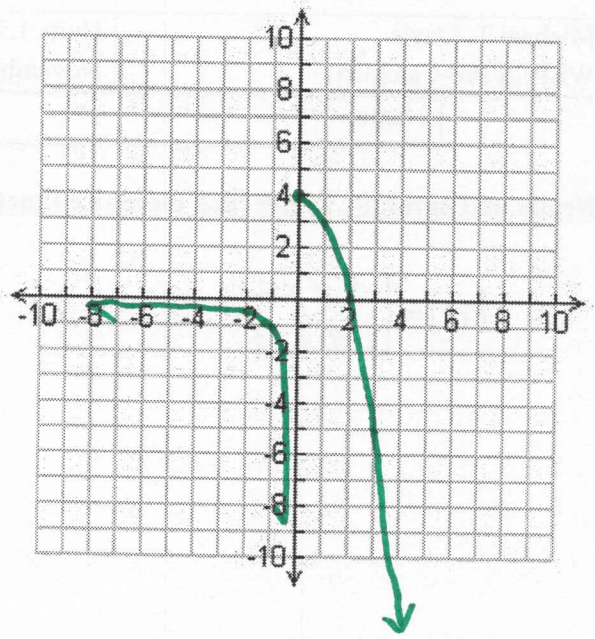
2.  $f(x) = \begin{cases} \frac{1}{2}x - 2 & \text{if } x \leq 2 \\ -x - 1 & \text{if } x > 2 \end{cases}$



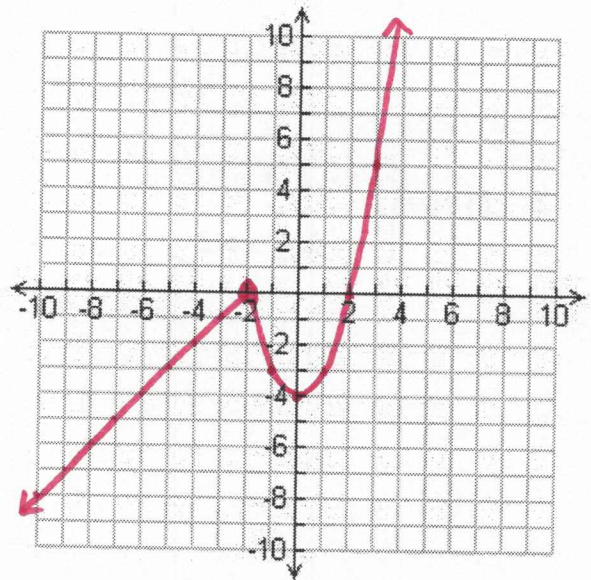
3.  $f(x) = \begin{cases} -x + 1 & \text{if } x < -1 \\ \sqrt{x+5} & \text{if } x \geq -1 \end{cases}$



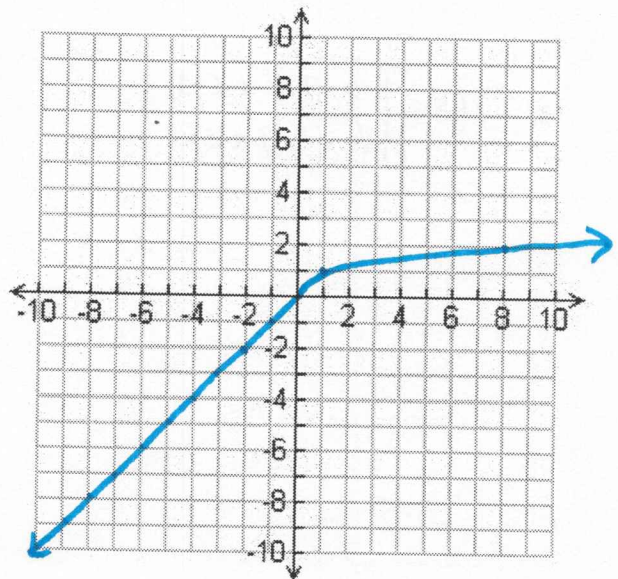
4.  $f(x) = \begin{cases} \frac{1}{x} & \text{if } x < 0 \\ 4 - x^2 & \text{if } x \geq 0 \end{cases}$



5.  $f(x) = \begin{cases} x^2 - 4 & \text{if } x > -2 \\ x + 2 & \text{if } x \leq -2 \end{cases}$

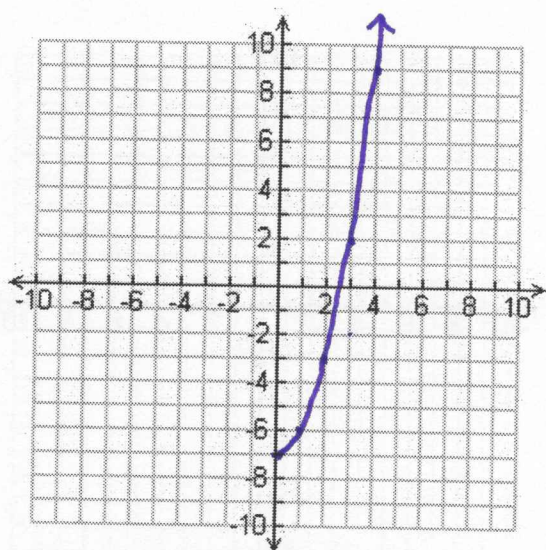


6.  $f(x) = \begin{cases} -|x| & \text{if } x \leq 0 \\ \sqrt[3]{x} & \text{if } x > 0 \end{cases}$

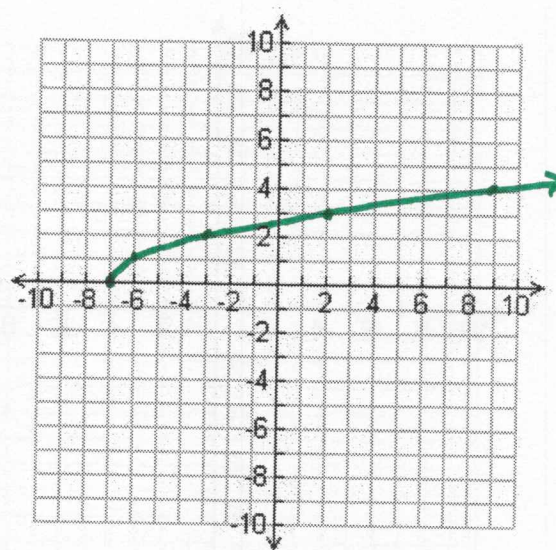




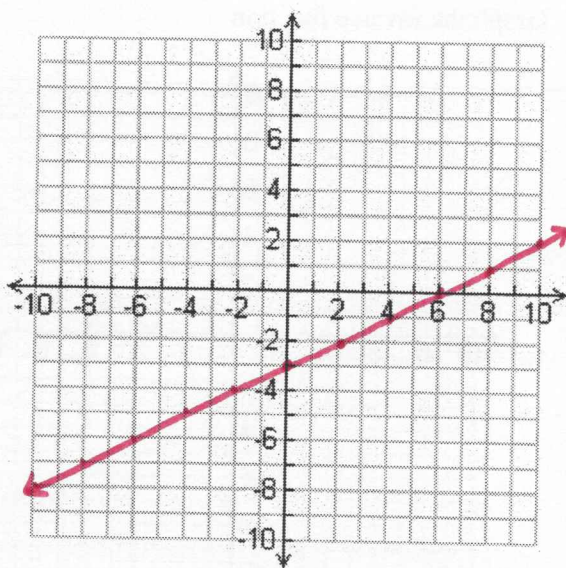
7. Graph  $f(x) = x^2 - 7$  if  $x \geq 0$



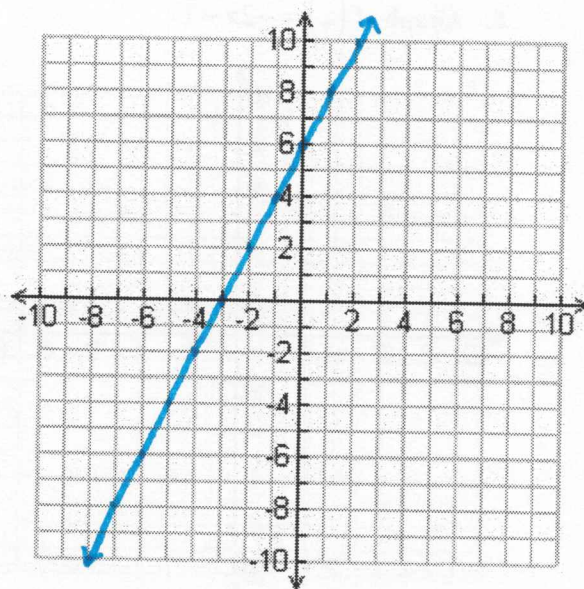
Graph the Inverse function



8. Graph  $f(x) = \frac{1}{2}x - 3$

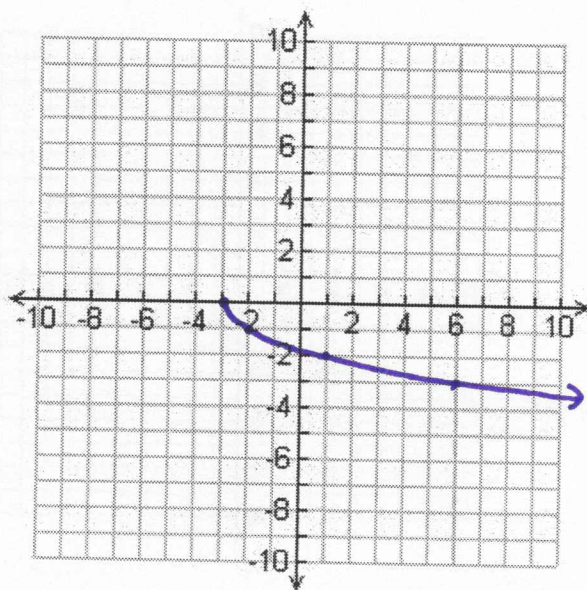


Graph the Inverse function

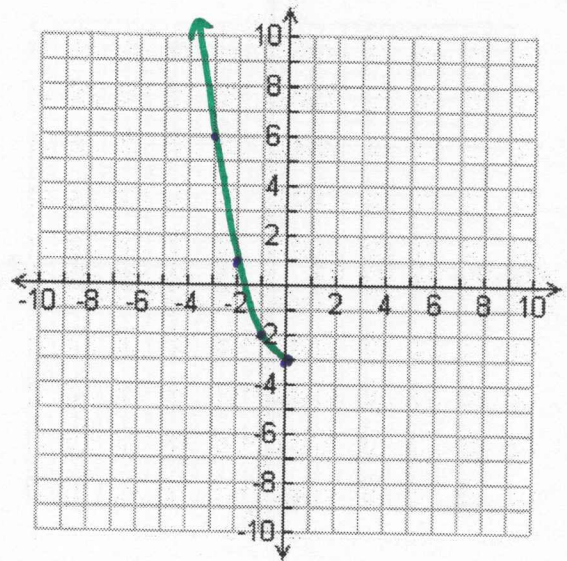




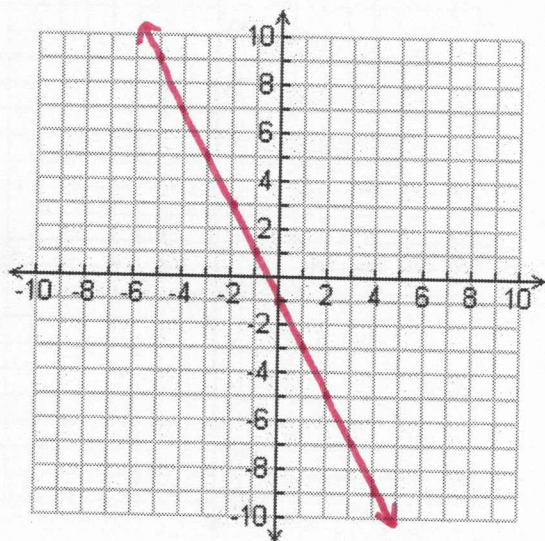
9. Graph  $f(x) = -\sqrt{x+3}$



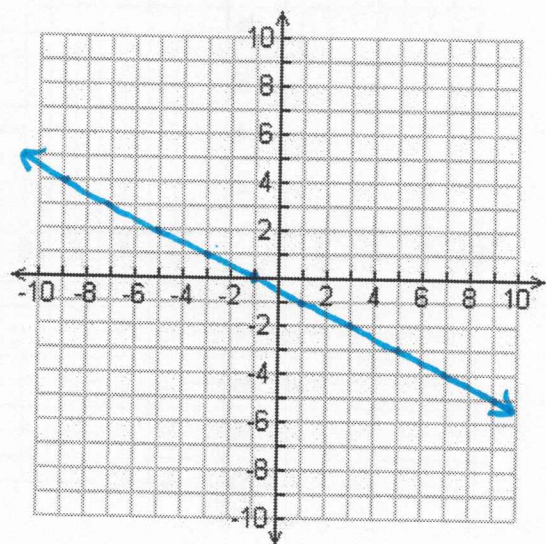
Graph the Inverse function



8. Graph  $f(x) = -2x - 1$



Graph the Inverse function



Determine an equation for the inverse function algebraically (pay special attention to the range of the original function because it gives you the domain of the inverse function)

9.  $f(x) = 3x - 1$

$$y = 3x - 1$$

$$x = 3y - 1$$

$$x + 1 = 3y$$

$$3y = x + 1$$

$$y = \frac{x+1}{3}$$

$$y = \frac{1}{3}x + \frac{1}{3}$$

$$f^{-1}(x) = \frac{1}{3}x + \frac{1}{3}$$

10.  $f(x) = \frac{3}{2}x - 12$

$$y = \frac{3}{2}x - 12$$

$$x = \frac{2}{3}y - 12$$

$$x + 12 = \frac{2}{3}y$$

$$\frac{2}{3}(x + 12) = y$$

$$y = \frac{2}{3}x + 8$$

$$f^{-1}(x) = \frac{2}{3}x + 8$$

11.  $f(x) = \sqrt{x+5}$  Note: The range of the original function gives you the domain of the inverse function.

$$y = \sqrt{x+5} \quad y \geq 0$$

$$x = \sqrt{y+5} \quad x \geq 0$$

$$x^2 = (\sqrt{y+5})^2 \quad x \geq 0$$

$$x^2 = y + 5 \quad x \geq 0$$

$$y = x^2 - 5 \quad x \geq 0$$

$$f^{-1}(x) = x^2 - 5 \text{ if } x \geq 0$$

half parabola

12.  $f(x) = \frac{1}{4}x + 3$

$$y = \frac{1}{4}x + 3$$

$$x = 4y + 12$$

$$x - 12 = 4y$$

$$4(x - 12) = y$$

$$y = 4x - 48$$

$$f^{-1}(x) = 4x - 48$$



13.  $f(x) = x^2$  if  $x \leq 0$  half parabola

$$y = x^2 \text{ if } x \leq 0$$

$$x = y^2 \text{ if } y \leq 0$$

$$y^2 = x \text{ if } y \leq 0$$

$$\sqrt{y^2} = \pm \sqrt{x} \text{ if } y \leq 0$$

$$y = -\sqrt{x}$$

$$f'(x) = -\sqrt{x}$$

14.  $f(x) = x^2 - 9$  if  $x \geq 0$  half parabola

$$y = x^2 - 9 \text{ if } x \geq 0$$

$$x = y^2 - 9 \text{ if } y \geq 0$$

$$x + 9 = y^2 \text{ if } y \geq 0$$

$$y^2 = x + 9 \text{ if } y \geq 0$$

$$\sqrt{y^2} = \pm \sqrt{x+9} \text{ if } y \geq 0$$

$$y = \sqrt{x+9} \text{ if } y \geq 0$$

$$f'(x) = \sqrt{x+9}$$

15.  $f(x) = \frac{1}{x}$

$$y = \frac{1}{x}$$

$$x = \frac{1}{y}$$

$$xy = 1$$

$$y = \frac{1}{x}$$

$$f'(x) = -\frac{1}{x^2}$$

16.  $f(x) = -x + 7$

$$y = -x + 7$$

$$x = -y + 7$$

$$x - 7 = -y$$

$$-y = x - 7$$

$$y = -x + 7$$

$$f'(x) = -1$$